

SA researchers commercialize carbon nanotubes

A South African-based professor and his partners have taken a giant leap to setup a carbon nanomaterials scale-up facility in Johannesburg. This is the first company to produce carbon nanotubes and related nanostructured materials at commercial scale in SA. The founder and CEO of the company, Professor Sabelo Mhlanga, had a vision to manufacture carbon nanotubes in 2008 during his time as a PhD student at the University of the Witwatersrand. Prof Mhlanga and his PhD colleague were inspired by the potential applications of carbon nanotubes, which have been realised today. He was supervised by Professor Neil Coville whom he says contributed immensely to his understanding and knowledge of carbon nanotubes and related materials. It was only in March 2018 that Prof Mhlanga and his team were awarded capital funding by the Industrial Development Corporation (IDC) of South Africa. This followed a due diligence process which they were subjected to in 2017. The IDC is a shareholder in the company.

About SabiNano

SabiNano (Pty) Ltd is a privately owned company that manufactures and supplies carbon nanotubes (CNTs) and other carbon nanomaterials in South Africa (SA). The company also conducts business in research and development (R&D) focusing on product/technology development, as well as consultation in nanoscience and nanotechnology. The company has extensive expertise and professional knowledge in the manufacturing of high quality CNTs and other carbon nanomaterials such as nitrogen-doped CNTs, carbon spheres, graphene oxide, for various applications. The company uses its own local (SA) developed CNT production process that entails using a novel, environmentally friendly and economical process to make carbon nanomaterials.

About the founder

Sabelo Mhlanga is the Founder and CEO of SabiNano (Pty) Ltd since 1 June 2018, a company he founded in 2008 with one of the company directors. He holds a PhD in Chemistry with focus on carbon nanomaterials from the University of the Witwatersrand (Wits, 2006) and a certificate in Management of Technology and Innovation (Wits, 2010) amongst other qualifications. He spent many years working as a university lecturer and researcher from 2010 (Wits) until he was appointed a full Professor (2015, UNISA) during which he occupied several positions as a Director/Deputy Director of various portfolios. He has published over 85 peer reviewed research outputs including papers, reviews, book chapters, technical reports, and conference proceedings. He has trained and supervised masters (15), doctoral (6) and post-doctoral (6) fellows with a focus area of nanotechnology and the water-energy-food nexus, who have graduated or completed their research since 2010. He is the CEO/Managing Director of SabiNano responsible for setting-up the company from being a start-up to becoming a full-scale commercial company. He oversees the day-to-day activities of the company at its head-office situated inside Mintek in Randburg, Johannesburg.

Harnessing the water-energy-food nexus with nanotechnology

Water, energy and food are essential for human well-being, poverty reduction and sustainable development (Food and Agricultural Organization, 2014). Each of the three sources is inter-related in a complex system, which has been referred to as the water-energy-food (WEF) nexus. This nexus suggests that if any one of these resources is not available or generates harmful waste, then one or both of the other are affected.

In South Africa, water and energy problems are reaching their peak, and these have been manifested by regular electricity blackouts, violent protests from communities demanding availability of clean water and sanitation services, as well as severe draughts experienced throughout the country between 2015 – 2018 (and ongoing). These drastic climate changes left us with no option but to do a self-introspection into how we use our resources and how we can be better prepared for climate change and its consequences thereof. Indeed, when there is no rain (water), we cannot have food, and if we have to use alternative sources of water, like seawater, current processes like desalination require a lot of energy, which is a scarce commodity in the region. It is this clear that all the three sectors - water, energy and food are inextricably linked and that actions in one area more often than not have impacts in one or both of the others. Besides developing energy efficient systems and technologies, as well as using clean/green forms of energy for domestic, agricultural and industrial use, it is also imperative to develop tools/indicators that will help us understand if we are making any progress in eradicating or overcoming the problems associated with the nexus, since these have a direct impact on the sustainable development of our countries.

Nanotechnology is a fast growing field in research and industry with more applications discovered daily in this fourth industrial revolution (4IR). Our approach is to apply green chemistry and engineering principles to nanotechnology (green nanotechnology) and to use a renewable energy sources (e.g. solar, wind, biomass) in addressing problems associated with the WEF nexus. Our team consists of experts with a wealth of experience in nanotechnologies (including carbon nanotechnology) and product development. Innovation is key for us in developing products and technologies to solve problems associated with the nexus and materials-based technological problems.

Product offering

SabiNano offers a range of carbon nanostructured materials. More information can be found on their website(www.sabinano.co.za). They can also be contacted via email (info@sabinano.co.za or smhlanga@sabinano.co.za).